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EXAMINER	
MCGILLEM, LAURA L	
ART UNIT	PAPER NUMBER
1636	

DATE MAILED: 10/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/721,144	HARIRI, ROBERT J.	
	Examiner	Art Unit	
	Laura McGillem	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-53* is/are pending in the application.

4a) Of the above claim(s) *39-49 and 51-53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38 and 50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/19/04, 7/23/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Restriction/Election

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1-38 and 50, drawn to a cytotherapeutic unit comprising a plurality of potent cells, a library of cytotherapeutic units and a kit comprising a cytotherapeutic unit, classified in class 424, subclass 93.21, for example.

II. Claims 39-49 and 51-53, drawn to a method of treatment of treating a disease comprising administering a cytotherapeutic unit or combining at least two cytotherapeutic unit members from a library of cytotherapeutic units and administering to a patient, classified in class 424, subclass 93.21, for example.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case, the product such as claimed can be used in a materially different process for using that product such as for *in vitro* laboratory experimentation to investigate differentiation of pluripotent cells.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

During a telephone conversation with Diane Descano on 8/18/2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-38 and 50. Affirmation of this election must be made by applicant in replying to this Office action. Claims 39-49 and 51-53 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and a product claim is subsequently found allowable, withdrawn process claims that depend from or otherwise include all the limitations of the allowable product claim will be rejoined in accordance with the provisions of MPEP § 821.04. **Process claims that depend from or otherwise include all the limitations of the patentable product** will be entered as a matter of right if the amendment is presented prior to final rejection or allowance, whichever is earlier. Amendments submitted after final rejection are governed by 37 CFR 1.116; amendments submitted after allowance are governed by 37 CFR 1.312.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103, and 112. Until an elected product claim is found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowed product claim will not be rejoined. See "Guidance on Treatment of Product and Process Claims in light of In re Ochiai, In re Brouwer and 35 U.S.C. § 103(b)," 1184 O.G. 86 (March 26, 1996). Additionally, in order to retain the right to rejoinder in accordance with the above policy, Applicant is advised that the process claims should be amended during prosecution either to maintain dependency on the product claims or to otherwise include the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the restriction requirement is withdrawn by the examiner before the patent issues. See MPEP § 804.01.

Priority

It is acknowledged that this application receives benefit of provisional Application No.60/429,702 filed 11/26/2002.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10-11,18-25, 28-30 and 34-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 is vague and indefinite because it recites a list of "CD34, CD8, CD10, OCT4" and it is unclear if the claim should be interpreted to mean that the cells should exhibit all of the antigenic determinants listed or only one selected from the listed group. It would be remedial to place the words --and-- or the word --or— in the list.

Claim 11 is vague and indefinite because it recites the phrase "derived from a plurality of sources" and it is not clear in what way cells will be derived from a plurality of sources and Claim 34 is vague and indefinite because it recites the phrase "derived from" umbilical cord blood and it is not clear in what way cells will be derived from blood. It would be remedial to replace "derived from" with --obtained from--.

Claims 18 and 28 are vague and indefinite because they recite the phrase "minimum numbers" and the metes and bounds of "minimum numbers" of cells are not clear.

Claim 23 is vague and indefinite because it recites the limitation "said certification" of claim 18 and there is no certification recited in claim 18.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-13, 15-24, 26-29, 31-32, 34-37 and 50 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a cytotherapeutic unit comprised of CD34+ and CD8+ cells for treatment of patients in need of hematopoietic cells, does not reasonably provide enablement for all other potent cell types for treatment of all disease states or conditions. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims.

Applicant claims a cytotherapeutic unit, a library of cytotherapeutic units and a kit comprising a plurality of potent cells including pluripotent cells with known identities and numbers obtained from fetal cord blood, fetal tissue, placenta and placenta perfusate or a plurality of sources and selected to be suitable for therapy for an indicated disease state or condition. The claims as written read on cytotherapeutic units and kits for stem cell therapy with multiple types of stem cells for any type of disease condition.

The test of enablement is whether one skilled in the art could make and use the claimed invention from the disclosures in the application coupled with information known

in the art without undue experimentation *United States v. Telectronics*, Inc., 8 USPQ2d 1217 (Fed. Cir. 1988). Whether undue experimentation is required is not based upon a single factor, but rather is a conclusion reached by weighing many factors. These factors were outlined in *Ex parte Forman*, 230 USPQ 546 (Bd. Pat. App. & Inter. 1986) and again in *In re Wands*, 8 USPQ2d 1400 (Fed. Cir. 1988) and include the following:

1) Scope of the claims. The claims read on a cytotherapeutic unit comprised of potent and pluripotent cells obtained from a variety of tissues including fetal tissue or a plurality of tissues. The claims are drawn to a kit comprising the cytotherapeutic unit for treatment of a person having a disease state or condition. These claims read on a cytotherapeutic unit comprised of almost any type of pluripotent cell capable of differentiating into many types of cells for treatment a very large group of any type of disease or condition.

2) Nature of the invention. The invention involves one of the most complex, unpredictable and controversial aspects of science and medicine to date, the use human stem cells for treatment of disease.

3) Unpredictability of the art. The art in the field of stem cell-related tissue engineering is unpredictable based on art-recognized issues such as efficacy, tumorigenicity, control of differentiation and safety. The use of stem cells in human therapeutics has broad issues including control of differentiation, persistence in the diseased or damaged area and uncontrolled proliferation control. For example, Pluchino et al (Brain Res. Reviews. 2005.Vol. 48, pp 211-219) note that although stem cell treatment strategies present real promise as therapeutic approaches, significant

questions need to be addressed before widespread use in humans. The issues in question include optimal sources of cells for transplantation, optimal administration methods, and determination of differentiation state and persistence of the transplanted cells in the area to be treated (See Pluchino, page 212, right column, last paragraph, in particular). It is unpredictable whether all effective therapeutic properties of the stem cell composition would remain after transplantation into a diseased organ because Pluchino et al teach an *in vivo* animal model example in which adult neuronal stem cells displayed altered pathways of differentiation when they were transplanted into diseased animals versus healthy animals (see page 213, right column, last paragraph, bridging to page 214, left column first paragraph, for example). Efficacy of therapeutic stem cell compositions is unpredictable because of multiple issues concerning optimization of the stem cell-based composition including how to predict migration or dispersion of the stem cells to or from the area to be treated (see page 214, left column, last paragraph, for example). In addition, any stem cells that are transplanted into a patient would be under the influence of a myriad number of growth factors, hormones and metabolic molecules which may influence their differentiation fate and efficacy of treatment (see page 214, right column, last paragraph, for example). In addition, Gerlach et al (J. Neurol. 2002. Vol. 249. Supplement pp. 111/33-111/35) cite multiple problems related to stem cell treatment including variations in therapeutic effect, side effects and the difficulty in using fetal or stem cell tissue (see pp. 111/34, column 1, paragraph 3, for example). The unpredictability of stem cell treatment also lies in the unregulated proliferative potential of stem cells. In light of this, Gerlach et al suggest therapeutic implantation of cells

differentiated *in vitro* prior to implantation, but also cite the need for elimination of the possibility of uncontrolled proliferation and long-term preliminary studies in animals prior to widespread administration of progenitor cells in human patients (See pp 111/34, column 2, paragraph 3, in particular).

4) State of the art. The art in the field of stem cell use for human therapeutics is poorly developed. In a recent review of stem cell therapy, Wobus and Boheler (Physiol. Rev. 2005 Vol. 85, pp. 635-678) teach that there are currently no embryonic stem cell based therapies on going in humans, in part due to multiple art-recognized problems such as immunogenicity, tumorigenicity, control of differentiation and ethical issues (see page 662, right column, last paragraph, and page 667, right column, 1st full paragraph, for example).

5) Amount of guidance presented by applicant. Applicant has presented examples of a cytotherapeutic unit used to treat patients with acute myelogenous leukemia or sickle cell anemia comprised of nucleated CD34+ and CD8+ cells with information regarding amounts of the cell types to be used. Applicant has not presented any guidance on how to use pluripotent cells from fetal cord blood, fetal tissue, placenta or placenta perfusate for treatment of any other disease state. There is no guidance to teach effective minimum numbers of stem cells that must be used in the cytotherapeutic unit, or whether the cells should be partially differentiated before inclusion in the composition. No information has been provided concerning when such a composition must be administered to treat the damaged organ or tissue in order to be effective. The skilled artisan would have to conduct trial and error experimentation to determine

whether the composition would be as effective if administered to an acute disease or condition or a long-term degenerative disease or condition. No guidance has been provided which addresses any art-recognized dangers, problems or side effects of a stem cell-based composition.

6) Number of working examples. Applicant has presented examples of a cytotherapeutic unit used to treat patients with acute myelogenous leukemia or sickle cell anemia comprised of nucleated CD34+ and CD8+ cells. Applicant has provided no working examples of a cytotherapeutic unit comprised of potent cell derived from one individual donor, or from at least two individuals or at least 5 individuals useful in treating a disease or condition.

7) Level of skill in the art. The level of skill in the art of practicing stem cell based therapy for treatment of organ or tissue damage is very low because the applicant has not been successful in reducing the therapeutic method to practice.

Given the above analysis of the factors which the Courts have determined are critical in ascertaining whether a claimed invention is enabled, it must be considered that the skilled artisan would have had to have practiced undue and excessive experimentation in order to practice the claimed invention.

Claims 14, 25, 30, 33 and 38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one

skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant claims a cytotherapeutic unit, a library of cytotherapeutic units and a kit comprising a plurality of potent cells including pluripotent cells with known identities and numbers obtained from fetal cord blood, fetal tissue, placenta and placenta perfusate or a plurality of sources and selected to be suitable for therapy for an indicated disease state or condition. Applicant claims embodiments of the cytotherapeutic unit comprising genetically modified potent cells for gene therapy (see specification paragraph 0056). The claims as written read on cytotherapeutic units and kits for stem cell therapy. These claims read on methods of gene therapy via administration of gene to cell via plasmid or viral expression vectors, and methods of gene therapy combined with stem cell therapy.

The test of enablement is whether one skilled in the art could make and use the claimed invention from the disclosures in the application coupled with information known in the art without undue experimentation *United States v. Telectronics*, Inc., 8 USPQ2d 1217 (Fed. Cir. 1988). Whether undue experimentation is required is not based upon a single factor, but rather is a conclusion reached by weighing many factors. These factors were outlined in *Ex parte Forman*, 230 USPQ 546 (Bd. Pat. App. & Inter. 1986) and again in *In re Wands*, 8 USPQ2d 1400 (Fed. Cir. 1988) and include the following:

1) Scope of the claims. The claims read on a cytotherapeutic unit comprised of potent and pluripotent cells obtained from a variety of tissues including fetal tissue or a plurality of tissues. The claims are drawn to a kit comprising the cytotherapeutic unit for treatment of a person having a disease state or condition which might be alleviated by

enzyme replacement or genes to correct inborn errors of metabolism. These claims read on a cytotherapeutic unit comprised of almost any type of pluripotent cell capable of differentiating into many types of cells for treatment a very large group of any type of diseases or condition.

2) Nature of the invention. The invention involves two of the most complex, unpredictable and controversial aspects of science and medicine to date, the use human stem cells and gene therapy for treatment of disease.

3) Unpredictability of the art. The art in the area of gene therapy is highly unpredictable. This unpredictability is manifested in virtually all levels of gene therapy from unpredictable and transient levels of gene expression *in vivo,* to the unpredictable nature of targeting the vectors to the appropriate cells, to the lack of suitable animal models for many human conditions to be treated by gene therapy. Stanworth and Newland (Clin. Med. Vol.1 (5). Pp.378-382) disclose potential for human therapeutics by combining gene therapy with stem cells, but also teach that gene therapy is hindered by multiple difficulties including vector design, efficiency of gene transfection, and lack of control of regulation of gene expression. The unpredictability of success of stem cell therapy is described in the above rejection.

4) State of the art. The art in the field of gene therapy combined with stem cell therapy is poorly developed. According to Stanworth and Newland, multiple issues impeding the widespread use of gene therapy and the combination of gene therapy and stem cells are known, including lack of efficiency of gene transfer and vector design as

well as regulatory and safety issues (see page 381, left column, 3rd paragraph, for example).

5) Amount of guidance presented by applicant. Applicant has not presented any guidance on how to genetically modify a potent cell for enzyme replacement or to serve as transgene carriers to correct inborn error of metabolism. There is no guidance to teach effective methods of transfection of the cells viral or non-viral vectors comprising the nucleic acids used to genetically modify the cells, or what amount of nucleic acid sequences encoding the polypeptides must be added to the composition, or whether the stem cells should be partially differentiated before inclusion in the composition. No information has been provided concerning when such a cytotherapeutic unit comprising genetically modified potent cells must be administered to treat the disease or condition in order to be effective. No information has been provided as to how the expression of a gene will be evaluated *in vivo*. The skilled artisan would have to conduct trial and error experimentation to determine whether the composition would be as effective if administered to subject with an acute disease or condition, as it would be to a patient with a long-term disease or condition. No guidance has been provided which addresses any art-recognized dangers, problems or side effects of gene therapy or gene therapy combined with stem cell therapy.

6) Number of working examples. Applicant gives no working examples of a cytotherapeutic unit comprising potent cells, which have been genetically modified and used to treat a subject with a disease or condition.

7) Level of skill in the art. The level of skill in the art of practicing a cytotherapeutic unit comprising potent cells which have been genetically modified (gene therapy) for treatment of a disease or condition is very low because the applicant has not been successful in reducing the therapeutic method to practice.

Given the above analysis of the factors which the Courts have determined are critical in ascertaining whether a claimed invention is enabled, it must be considered that the skilled artisan would have had to have practiced undue and excessive experimentation in order to practice the claimed invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 14-21, 23, 25-33 and 50 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,461,645 (Boyse et al).

Applicant claims a cytotherapeutic unit, and a kit comprising a plurality of potent cells including pluripotent cells with known identities and numbers obtained from fetal

cord blood, fetal tissue, placenta and placenta perfusate and selected to be suitable for therapy for an indicated disease state or condition.

Boyse et al teach a population of fetal or neonatal stem cells which can be cryopreserved and thawed for therapeutic use (see column 10, lines 50-58, for example). Boyse et al teach isolation of a population of cells (see column 11, lines 1-20, for example), followed by cell separation procedures, including fluorescence-activated cell sorting, that entail immunological recognition of the cells through antigenic determinants to enrich the cell sample for hematopoietic stem and progenitor cells (see column 16, lines 44-60, and column 17, lines 47-50,for example) which reads on a cytotherapeutic unit comprising a plurality of potent cells wherein the identity and number of at least some of the cells are known and the identity of at least some of the cells is reflective of cellular antigenic determinants.

Boyse et al teach that the cells can be cryopreserved for a period of time before thawing for use. In a preferred embodiment, the cell population is tested after thawing to confirm the identity and viability of the cells (see column 22, lines 60-67, column 49, lines 64-67, column 50, lines 1-55 and Table V, for example) which reads on the cytotherapeutic unit being assayed to ensure the accuracy of the cell identity, and since assays of viability can determine numbers of live and dead cells, reads on the unit being assayed to determine the numbers of at least some of the plurality of cells. The thawed assayed cells taught by Boyse et al also read on a cytotherapeutic unit and a kit for treatment of a person having a disease state or condition comprising the therapeutic unit described *supra* with said unit being assayed to ensure the accuracy of the assay

and certified for the accuracy of the assay, according to the embodiment of certification of the accuracy disclosed in the instant application which is a list of at least some of the types of cells are identified (See instant specification, paragraph 0050). Boyse et al teach isolation of a population of cells from fetal blood taken at the root of the placenta or the placenta, or delivered placenta (see Fig. 2, column 8, lines 6-9 and column 11, lines 1-20, for example), which reads on a cytotherapeutic unit wherein the potent cells are obtained from fetal cord blood, placenta or postpartum placenta. Boyse also disclose that hematopoietic stem or progenitor cell from the bone marrow, spleen or blood are pluripotent cells (see column 2, lines 13-20, in particular) which reads on umbilical cord blood cells in a cytotherapeutic unit which are pluripotent cells.

Boyse et al also teach that only one early stem cell is likely needed to repopulate an entire hematopoietic system, but that more than one cell may be required to repopulate a defective or anemic hematopoietic system and can be achieved through cautionary enrichment of the hematopoietic and progenitor cell population (see column 19, lines 30-53, for example) which reads on a cytotherapeutic unit with minimum numbers of preselected types of potent cells, selected for therapy for an indicated condition such as anemia. Boyse et al disclose a method of enrichment of hematopoietic stem or progenitor cells comprising depleting T lymphocytes from the population (see column 19, lines 15-29, for example) which reads on embodiments of a cytotherapeutic unit and a kit wherein at least one cell is excluded from the unit. Boyse et al also teach a cytotherapeutic unit from umbilical cord blood which has been T-lymphocyte depleted and which is further treated to removed mature granulocytes (see

column 17, lines 25-29), which reads on a cytotherapeutic unit wherein a plurality of cell types have been removed.

Boyse et al teach a population of cells for therapeutic use in which the stem and progenitor cells have stably incorporated a heterologous gene for the purposes of gene therapy (see column 29, lines 18-36, for example) which reads on a cytotherapeutic unit wherein the potent cells have been genetically modified

Boyse et al disclose that approximately 109 umbilical cord blood samples were collected, counted for viable cells and prepared for hematopoietic assays, frozen and defrosted for assays to assess recovery and type of hematopoietic cells (see column 32, lines 55-67, for example), which reads on a library of cytotherapeutic units, each comprising a plurality of potent cells wherein the identity and numbers of at least some of the cells is known, and units are assayed to ensure accuracy of identities and numbers.

Claims 1-4, 10, 14-21, 23, 25-33 and 50 are rejected under 35 U.S.C. 102(a) as being anticipated by Lum (U.S. Patent Application No. US2002/0132343, of record).

Applicant claims a cytotherapeutic unit, and a kit comprising a plurality of potent cells including pluripotent cells with known identities and numbers wherein at least one type of cell is excluded from the unit and wherein a plurality of cell types has been removed from the unit.

Lum teaches umbilical cord blood stem and progenitor cells for transplantation in a Structured Cord Blood System including the collection, production and delivery of

umbilical cord stem cells for transplantation and clinical use to treat diseases (see paragraphs 0010, 0011, 0022 and 0067) which reads on a library of cytotherapeutic units and a single cytotherapeutic unit and a kit for treatment of a patient comprising plurality of pluripotent cells. Lum further teaches that the umbilical cord blood stem and progenitor cells are characterized by cell counting and phenotype assessment (see paragraph 0050) which reads on a cytotherapeutic unit comprises a plurality of potent cell wherein the identity and numbers of at least some of the cells are known. Lum teaches that the stem cells can be identified and selected by antigenic determinants such as CD8 and CD34+ (see paragraphs 0015 and 0080), which reads on the cytotherapeutic unit in which the cells are identified by the presence of an antigenic determinant and exhibit CD34 or CD8, and also reads on a cytotherapeutic unit in which the cells are preselected.

Lum teaches that hematopoietic cell collection and processing for clinical use will be documented and that steps used to screen umbilical cord blood sample will be investigated, documented, validated and revalidated (see paragraphs 0028-0029, 0038 and 0080, for example), which reads on a cytotherapeutic unit that is assayed to ensure accuracy of cell identity and numbers, and certified by the provider. Lum discloses expansion of a small number of umbilical cord blood potent cells for clinical use, into at least 100 million CD34+ cells (see paragraphs 0017 and 0097, for example), which reads on a minimum number of preselected cells in a cytotherapeutic unit.

Lum also discloses that the stem cell population can be purified by lysing the red blood cells and also by additionally purging the population of nucleated cell subsets

(see paragraphs 0053 and 0056, in particular), which reads on a cytotherapeutic unit wherein at least one type of cell is excluded from the unit and wherein a plurality of cell types has been removed from the unit.

Lum disclose that the stem cells can be genetically altered to include an exogenous DNA sequence (see paragraph 0057, for example), which reads n a cytotherapeutic unit which has been genetically modified.

Claims 1, 4-5 and 11-13 are rejected under 35 U.S.C. 102(a) as being anticipated by Koopmans et al (U.S. Patent Application No. 2002/0102239).

Applicant claims a cytotherapeutic unit, and a kit comprising a plurality of potent cells including pluripotent cells with known identities and numbers wherein potent cells are obtained from fetal tissue or a plurality of sources, or where cells are obtained from at least two individuals or at least five individuals.

Koopmans et al teach preparation of neural stem or progenitor cells from mammalian brain for use in transplantation. Koopmans et al teach embodiments in which the neural stem or progenitor cells are obtained from the central nervous system and can be differentiated by treatment with art-recognized factors (see paragraphs 0058-059, for example) which reads on a cytotherapeutic unit comprising a plurality of potent cells. Koopmans et al disclose a preparation method in which a cell suspension is assayed for cell number and implanted in rat brains for presence of tyrosine hydroxylase positive (TH+) neurons (see paragraphs 0085-0087, for example), which reads on a cytotherapeutic unit in which the number and identity of at least some of the

cells are known. Koopmans et al teach that a portion of the cell preparation was cryopreserved and subsequently thawed and the cells were recounted and tested for presence of neural cell markers or presence of TH+ neurons (see paragraphs 0078-0080 and 0091-0092, for example) which reads on a cytotherapeutic unit in which the unit is assayed to ensure the accuracy of the identities and number of cells in the unit and assay in which the presence or absence of antigenic determinant is examined on the cells. Cells can be obtained from multiple donors (6-10 per litter) of fetal ventral mesencephalon and pooled (see paragraph 0013, 0085 and 0095, for example) which reads on a cytotherapeutic unit wherein potent cells are obtained from fetal tissue or a plurality of sources, or where cells are obtained from at least two individuals or at least five individuals.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura McGillem whose telephone number is (571) 272-8783. The examiner can normally be reached on M-F 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Irem Yucel can be reached on (571) 272-0781. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Laura McGillem, PhD
9/29/2005

DAVID GUZO
PRIMARY EXAMINER